

Abstract of the Disclosure

A method of manufacturing a silicon optoelectronic device, a silicon optoelectronic device manufactured by the method, and an image input and/or output apparatus including the silicon optoelectronic device are provided. The method includes preparing an n- or p-type silicon-based substrate, forming a microdefect pattern along a surface of the substrate by etching, forming a control film with an opening on the microdefect pattern, and forming a doping region on the surface of the substrate having the microdefect pattern in such a way that a predetermined dopant of the opposite type to the substrate is injected onto the substrate through the opening of the control film to be doped to a depth so that a photoelectric conversion effect leading to light emission and/or reception by quantum confinement effect in the p-n junction occurs. The silicon optoelectronic device has superior light-emitting efficiency, can be used as at least one of a light-emitting device and a light-receiving device, and has high wavelength selectivity. In addition, the silicon optoelectronic device panel having the two-dimensional array of the silicon optoelectronic devices can be applied in the image input and/or output apparatus capable of directly displaying an image and/or inputting optical information in a screen.